
EXECUTIVE SUMMARY

This chapter addresses recent trends in military modernization activities in the Asia-Pacific and how new capabilities will affect regional security.

MAIN ARGUMENT:

Asia-Pacific militaries have added considerably to their arsenals over the past fifteen years. Military modernization in the region has been propelled by regional geopolitical forces, enabled by robust defense spending and a buyer's market in the international arms market, and stirred by the transformative promise of network-centric warfare. Asia-Pacific countries are acquiring hardware that, at least on the surface, imbues their militaries with new capacities for warfighting in terms of mobility, speed, precision strike, firepower, battlespace intelligence, communications, and command and control. At the same time, relative gains in military power may be moderated by deficiencies in other areas, particularly in doctrine, training, and organization.

POLICY IMPLICATIONS:

- Conflict in the region, should it occur, is likely to be increasingly “high-tech,” that is, faster, more mobile, occurring over long distances, and yet more precise and lethal in terms of firepower, and therefore possibly more devastating in its effects.
- Less obvious deficiencies in so-called software areas (e.g., lack of jointness) and low numbers of modern weapons systems could mitigate the military power of states in the region and reduce their military potential, making these states less threatening than they appear.
- U.S. allies could also be limited in their ability to contribute to U.S.-led contingency and stabilization operations or to cooperate in regional security-building.

Military Modernization

Military Modernization in the Asia-Pacific: Assessing New Capabilities

Richard A. Bitzinger

The militaries of the Asia-Pacific have undergone a significant, if not unprecedented, build-up over the past several years, particularly in terms of quality and means. From Japan to Southeast Asia to India, regional militaries have been adding new capabilities, and therefore the capacity for new roles and missions, to their inventories. Local navies have acquired new types of ships, both surface and undersea, that provide capabilities for force projection and expeditionary operations that these states previously lacked. Air forces have bought modern fighter jets, many armed for the first time with weaponry providing capabilities for air-to-air interdiction beyond visual range and precision-guided air-to-ground missions. Ground forces have new weapons systems, ordnance, and military equipment to increase their firepower, lethality, and mobility. In addition, regional militaries are gaining both the hardware and the software to improve their capacities for surveillance, reconnaissance, target acquisition, and command and control.

This chapter argues that, despite the considerable expansion in absolute capabilities for warfighting by many Asia-Pacific militaries as a result of this modernization process, the relative gains in military capacity have been more mixed. Some countries have increased their military capacities vis-à-vis potential competitors (e.g., China vs. Taiwan), but not others (e.g., China vs. the United States). More importantly, many Asian militaries still lack critical elements, particularly in so-called software areas such as training and doctrine, that would improve the synergy of hardware advancements.

This chapter consists of five parts. The first section focuses on the geopolitical context behind military modernization efforts in the region

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and the political-military factors driving this process. The second section discusses three key dynamics affecting this modernization process: defense spending, arms imports, and the “revolution in military affairs.” The third section then evaluates recent trends in regional military modernization, particularly the types of new military equipment and weapons systems being procured and the new warfighting capabilities they might bring to local militaries. The fourth section makes a net assessment of these acquisition efforts, examining whether and how much overall military modernization activities in the Asia-Pacific have actually added to regional military capabilities as well as where critical shortcomings may still lie. Finally, a conclusion sums up this analysis of militaries capabilities in the region.

Why Military Modernization?

The Regional Political-Military Context

Countries in the Asia-Pacific have many reasons for acquiring new defense hardware and improving national military capabilities. The region is clearly one of constantly shifting security dynamics, with rising great powers (China and India), new threats and security challenges (missile attacks, terrorism, proliferation of WMDs, international crime, and the like), ongoing territorial disputes (for example, the Senkaku/Diaoyutai Islands and the Spratlys), and new military commitments (such as contingency and stabilization operations) that require new capabilities for surveillance, force projection, mobility, firepower, and joint operations. All of these factors, in one way or another, are affecting regional military modernization activities.

At the same, changes within the U.S. military are also having a considerable impact on the security calculus of states in the Asia-Pacific and therefore on military modernization activities in the region. Increasingly, the U.S. armed forces must be prepared to manage both global and regional contingency operations. As these forces become more mobile and expeditionary, they will significantly alter the size, character, and scope of the U.S. military in the Asia-Pacific. The U.S. military’s “center of gravity” will shift farther south and east as troops are removed from South Korea and especially as 8,000 marines of the III Marine Expeditionary Force are relocated from Okinawa to Guam. In particular, the U.S. territory of Guam will grow in importance as a forward-basing area and become the home for B-2 and B-52 bombers and attack submarines deployed to the Pacific area of operations. Moreover, as U.S. forces transition to fighting mobile high-tech wars—which will require that they become more expeditionary, operationally flexible and agile, and capable of dealing with global as well as regional contingencies—so too will the military increasingly require

the support and assistance of allies and other partners. Interoperability, therefore, particularly in regional or even out-of-area operations, will become a much higher priority for the U.S. military. Overall, U.S. forces are being drawn down in the Asia-Pacific and reoriented for global as opposed to static operations, and this shift is influencing the military modernization decisions made by countries in the region.

China and India, of course, possess great power aspirations that drive their requirements for modern militaries that are capable of projecting and sustaining power, delivering firepower and precision-strikes, and dominating the information battlespace. Beijing, for example, seeks to gain “hard” power commensurate with growing “soft” power (i.e., economic, diplomatic, and cultural). Naturally, China still seeks sufficient military capabilities to deal with any “Taiwan contingency”—that is, the ability to isolate the island, invade and occupy it if necessary, and engage in anti-access/area denial operations to interdict U.S. forces seeking to come to the island’s defense. Additionally, China wants to be able to press its territorial and exclusive economic zone (EEZ) claims in the East and South China seas. Finally, Beijing increasingly seeks the military means to police and protect sea lines of communication (SLOC) in order to safeguard Chinese shipping and trade as well as to secure energy supplies, given China’s reliance on oil and gas imports.

Consequently, China is keen to build expeditionary forces capable of projecting power out to the “second island chain,” which is delineated by Guam, Indonesia, and Australia. Eventually, it hopes to be able to project sustainable force throughout the whole of the Western Pacific and into the Indian Ocean. In particular, this goal has led Beijing to deemphasize ground forces in favor of building up the naval, air, and missile forces of the People’s Liberation Army (PLA). China’s 2006 defense white paper states that the PLA Navy “aims at gradual extension of the strategic depth for offshore defensive operations and enhancing its capabilities in integrated maritime operations.” The PLA Air Force, for its part, “aims at speeding up its transition from territorial air defense to both offensive and defensive operations, and increasing its capabilities in the areas of air strike, air and missile defense, early warning and reconnaissance, and strategic projection.”¹

Additionally, the PLA increasingly sees considerable force multipliers in network-centric warfare—the stuff of the current revolution in military affairs (RMA) led by advances in information technologies (IT). Consequently, the PLA is putting considerable effort and resources into

¹ Information Office of the State Council of the People’s Republic of China, *China’s National Defense in 2006* (December 29, 2006), http://www.chinadaily.com.cn/china/2006-12/29/content_771191.htm.

building its capabilities for “informationalized” warfare by expanding its infrastructure in command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR); by pursuing integrated joint operations via networking; and by adopting information warfare (IW) as a key offensive tool.²

India also aspires to become a regional great power, particularly in terms of asserting military strength throughout the Indian Ocean area. In particular, this entails the protection of local SLOCs (90% of the country’s trade, and most notably oil and gas supplies, transits through the Indian Ocean), sovereignty enforcement, and sea area denial to adversaries.³ India is increasingly keen to build national capacities for power projection, long-range surveillance and intelligence, and expeditionary warfare.⁴ These taskings particularly favor the Indian Navy, which in turn is increasingly becoming the high-tech focus of the military.⁵ Additionally, these great-power aspirations are manifested in the country’s efforts to develop its nascent nuclear forces (including land- and sea-based missile delivery systems) and in continuing interest in how the country might harness its growing expertise in IT in order to pursue an IT-led RMA.⁶

Japan’s current military modernization efforts are driven by three factors: the need to deal with new emerging regional threats, the requirement for increased interoperability with an expeditionary U.S. military, and the desire for the “normalization” of Japanese foreign and defense policy. As the threat of a Soviet attack on the Japanese mainland has disappeared, other security concerns have arisen, particularly missile threats from North Korea, international terrorism, and instability in regions far from Japan that could nevertheless affect Japanese economic, political, and military security. At the same time, within Northeast Asia, China has become a growing security concern, as evidenced by large Chinese military exercises that took place in April 2010 near Japanese territorial waters⁷ as well as by the ongoing dispute over the Senkaku/Diaoyutai Islands.

Additionally, Japan is a critical U.S. ally in Asia and, as such, serves as a forward-operating area for U.S. forces in the region. The Japan

² You Ji, “Learning and Catching Up: China’s Revolution in Military Affairs Initiative,” in *The Information Revolution in Military Affairs in Asia*, ed. Emily O. Goldman and Thomas G. Mahnken (New York: Palgrave MacMillan, 2004), 97–123.

³ Rahul Bedi, “Getting in Step: India Country Briefing,” *Jane’s Defence Weekly*, February 6, 2008.

⁴ Ibid.

⁵ Rahul Bedi, “Indian Navy Strives for Regional Dominance,” *Jane’s Defence Weekly*, December 21, 2005.

⁶ Thomas G. Mahnken and Timothy D. Hoyt, “Indian View of the Emerging Revolution in Military Affairs,” *National Security Studies Quarterly* 6, no. 3 (Summer 2000): 55–80.

⁷ Greg Torode, “Exercises Off Japan and Taiwan Show PLA Navy’s New Strength,” *South China Morning Post*, April 18, 2010.

Self-Defense Forces (SDF) are also increasingly partners with U.S. forces (and by extension, with NATO and Australian forces) in contingency operations, such as security-building in the Indian Ocean; patrolling the Straits of Malacca; and stabilization operations in Iraq and Afghanistan. Consequently, Japan's security interests have expanded far beyond Northeast Asia, and the SDF have accordingly greatly increased their mobility and expeditionary capabilities, firepower, and C4ISR.

Finally, Japan is keen to pursue a foreign and defense policy more befitting a "normal" nation, and Tokyo has permitted the country's military to play a larger and more active role in regional security missions. Japan's Liberal Democratic Party (LDP), in particular, has sought to upgrade the status of the SDF and legitimize their role as a military force. In addition, many politicians have called for the revision of Japan's so-called Peace Constitution in order to explicitly permit the maintenance of self-defense forces and to allow these forces to be used in international peacekeeping and security operations.

Australian defense planning is increasingly driven by growing concerns over a militarily rising China, as well as by emerging requirements to interoperate with U.S. forces in a variety of contingency and stabilization operations. Over the past decade Canberra has shifted its defense posture away from simply a defense of the Australian homeland to expeditionary operations both in the country's immediate neighborhood (e.g., East Timor and the Solomon Islands) and further afield (e.g., Afghanistan and Iraq).

Overall, the Australian Defence Force (ADF) wants to be capable of making a significant contribution to coalition and allied operations with the United States, while at the same time maintaining an independent deployment capability that can contribute to peace and stability within the country's geographic area of responsibility, either alone or as the head of coalition operations. These conditions, in turn, have translated into new requirements for greater mobility (in particular, the ability to move and sustain a 3,000-man brigade), versatility, firepower ("robustness"), sustainability, and jointness. The ADF must be more deployable, more sustainable over long periods and across long distances, and capable of engaging in both low-level and high-intensity high-tech wars.⁸ As a practical result, the ADF is currently seeking to improve its capabilities in a number of key areas: amphibious and expeditionary capacity; enhanced survivability

⁸ Australian Department of Defence, *Australia's National Security: Defence Update 2005* (Canberra: Commonwealth of Australia, 2005).

and firepower; intelligence-gathering, surveillance, and reconnaissance; logistics; and networking and communications.⁹

Military modernization activities within the smaller countries of the Asia-Pacific have enjoyed their own particular momentum. The Republic of Korea (ROK, or South Korea), in addition to being confronted by a possibly growing threat from North Korea, also has growing pretensions of becoming a regional power. As such, Seoul is pursuing military acquisition programs intended to increase the capacities of the ROK Armed Forces in order to permit them to act more independently of the U.S. military and in support of a more nationalistic, self-reliant, and self-assertive foreign and defense policy.¹⁰ This is apparent in South Korea's efforts to acquire a blue water navy (complete with a large fleet of ocean-going submarines) that will rival Japan's and China's maritime forces.

In Southeast Asia, there are renewed concerns over China's "creeping assertiveness" in the South China Sea and growing military strength.¹¹ China has been building up its military forces in the area (particularly on Hainan Island, which is becoming a major base for nuclear-powered submarines), and Beijing has become more adamant in pressing territorial claims over the Paracel and Spratly islands.¹² Additionally, Southeast Asian countries face new unconventional threats, particularly piracy, terrorism, international crime, and human trafficking. At the same time, many Southeast Asian states are just as often suspicious of each other as they are of external powers such as China, with historical animosities still existing between Malaysia and Singapore, Malaysia and Indonesia, and Thailand and Burma, to name but a few. Moreover, competing claims over EEZs in the South China Sea and over the Spratly Islands are just as strong between the various Southeast Asian nations as they are between these nations and Beijing. Consequently, these tensions have also been powerful motivators behind recent national military build-ups in the region, especially when it comes to acquiring

⁹ Australian Department of Defence, *Australia's National Security: Defence Update 2005*; and Australian Department of Defence, "The Hardened and Networked Army," 2005.

¹⁰ Hoon Noh, "South Korea's 'Cooperative Self-Reliant Defense': Goals and Directions," Korea Institute for Defense Analyses, KIDA Paper, no. 10, April 2005, 5; and the Republic of Korea, Ministry of National Defense, *2004 Defense White Paper* (Seoul: Ministry of National Defense, 2004), 92–98.

¹¹ See Ian Storey, "China's 'Charm Offensive' Loses Momentum in Southeast Asia [Part I]," Jamestown Foundation, China Brief, April 29, 2010; and Ian Storey, "China's 'Charm Offensive' Loses Momentum in Southeast Asia [Part II]," Jamestown Foundation, China Brief, May 13, 2010.

¹² See Richard A. Bitzinger, "The China Syndrome: Chinese Military Modernization and the Rearming of Southeast Asia," S. Rajaratnam School of International Studies (RSIS), Working Paper, no. 126, May 2, 2007.

capabilities—particularly long-range naval and air forces—for patrolling and protecting EEZs and promoting sovereignty rights.¹³

Three Key Dynamics Affecting Military Modernization in the Asia-Pacific: Defense Spending, Arms Imports, and the Revolution in Military Affairs

Defense Spending

Certainly, rising military budgets have underwritten a significant regional arms build-up. Defense expenditures have increased significantly over the past decade or more; even the Asian financial crisis of the late 1990s appears to have had no permanent effect on military spending. China, for example, has experienced real (i.e., after inflation) double-digit increases in defense expenditures nearly every year since 1997. Between 1997 and 2005, Chinese military expenditures grew 13.7% per annum, according to the country's own statistics. China's official 2010 defense budget of \$78 billion constituted "only" a 7.5% rise over the previous year—compared with a 15% increase in 2009—but this was more than enough to vault the country into second place among the world's top military spenders. China now outspends Japan, France, Russia, and the United Kingdom on national defense. Overall, Chinese military expenditures have more than quintupled in real terms since the late 1990s, permitting Beijing to put considerable resources into the hardware and software of military modernization.

Other Asia-Pacific nations have also greatly increased defense expenditures over the past decade. Indian defense spending has grown by two-thirds between 1998 and 2008, according to data provided by the Stockholm International Peace Research Institute (SIPRI);¹⁴ in 2010, Indian military expenditures have totaled approximately \$32 billion. Australia's defense spending has increased by 46% over the same period, while South Korea's has increased by 48%.¹⁵ Of all the larger countries in the Asia-Pacific, only Japan and Taiwan have needed to contend with relatively static military budgets. Even so, Taipei recently secured additional funding for arms acquisitions and in 2008 finally closed a \$6.5 billion deal with the United States for the purchase of several types of weapons systems, including

¹³ Andrew Tan, "Force Modernization Trends in Southeast Asia," Institute of Defence and Strategic Studies, Working Paper, 2004, 30–31.

¹⁴ Stockholm International Peace Research Institute (SIPRI), SIPRI Military Expenditure Database, 2010, <http://milexdata.sipri.org>.

¹⁵ Ibid.

Patriot PAC-3 missiles, AH-64 attack helicopters, Harpoon ASCMs, and Javelin antitank PGMs.

Defense spending in Southeast Asia has in particular recovered from the Asian financial crisis, thus permitting a new round of arms acquisitions. According to SIPRI, Malaysia's military budget more than doubled between 2000 and 2008, from \$1.7 billion to \$3.5 billion (as measured in constant 2005 dollars). Indonesian defense spending over the same period grew from \$2.2 billion to \$3.8 billion (a 72% rise), while Thailand increased military expenditures by 43%, from \$2.1 billion to \$3 billion. Singaporean defense expenditures rose 26%, from \$4.6 billion in 2000 to \$5.8 billion in 2008 (again, in constant 2005 dollars); in 2010, Singapore's military budget totaled \$8.4 billion. Altogether, military spending in Southeast Asia rose by at least 50% in real terms between 2000 and 2008.¹⁶

The remarkable economic growth experienced by most Asia-Pacific nations over the past twenty years or so has enabled this expansion in military spending and procurement. According to the International Monetary Fund (IMF), China's GDP grew five-fold from 1990 to 2008. India's GDP nearly tripled over the same timeframe. China and India, in fact, have been the fastest and second-fastest growing economies in the world, respectively. Other countries in the Asia-Pacific have experienced similar economic expansion: from 1990 to 2008, South Korea's GDP grew 160%; Taiwan's, 140%; Malaysia's, 200%; and Singapore's, 200%.¹⁷

This near-continuous long-term growth in local economies has meant that the burden of defense spending has remained manageable even as military expenditures have increased. China's defense budget for the past decade has never exceeded 2% of the country's GDP, for example. From 1998 to 2008, defense spending in India was nearly constant at around 2.8% of GDP, while South Korea's military expenditures averaged around 2.6% of GDP and Malaysia's approximately 2.1%. Japan's budget is unofficially pegged at about 1% of GDP. Only Singapore (and probably North Korea, as well) has devoted a relatively high percentage of GDP to defense (an average of 4.7% during 1998–2008), and even then that figure has dropped from a high of 5.4% in 1998 to 4.1% in 2008.¹⁸

¹⁶ SIPRI, SIPRI Military Expenditure Database.

¹⁷ International Monetary Fund, World Economic Outlook Database, April 2005, <http://www.imf.org/external/pubs/ft/weo/2009/02/weodata/weoselgr.aspx>.

¹⁸ SIPRI, SIPRI Military Expenditure Database.

Arms Imports

Along with rising regional defense spending, the highly competitive nature of the current global arms market has also meant that there are a lot of motivated sellers on the supply side. Asia accounted for 42% of all arms deliveries—and 41% of all arms sales agreements—between 2001 and 2008, according to the Congressional Research Service.¹⁹ The region is second only to the Middle East in terms of arms imports. Some of the world's largest arms buyers are located in Asia. India, for example, bought nearly \$31 billion worth of weaponry during the 2001–08 period, while China signed arms agreements worth \$12.5 billion over the same timeframe. Singapore and Malaysia are some of the largest arms buyers in Southeast Asia. Singapore took delivery of some \$3.8 billion worth of arms from 2005 to 2009, placing it seventh among all arms importers, according to SIPRI.²⁰ Meanwhile, Kuala Lumpur has purchased over \$5 billion worth of arms since the late 1990s.²¹ India is a large buyer of weapons systems from Russia (e.g., Su-30 MKI fighter jets, Kilo-class submarines, and T-72 tanks), while Australia, Japan, and South Korea have historically made major purchases from the United States of combat aircraft (e.g., F-15, F-16, and F/A-18) and naval systems (e.g., the Aegis air-defense system and the Standard surface-to-missile system), to name but a few.

Because military procurement budgets have fallen significantly since the end of the Cold War, arms producers have increasingly sought out new markets abroad to compensate for the shrinking ones at home. In particular, the leading European, Russian, and Israeli defense firms now typically export the vast majority of their industrial output. BAE Systems, for example, does less than 25% of its business inside the UK, while Thales derives roughly three-quarters of the firm's revenues from outside France. For Saab, only around 30% of its business is with the Swedish military. The Israeli defense industry typically exports more than 75% of its products, and the Russian arms industry is believed to rely on overseas sales for up to 90% of its income.²² In other words, for some of the major players in the arms industry the overseas arms business has become larger—much larger, in fact—than domestic markets.

For their part, U.S. defense companies have traditionally not needed to rely on arms exports, given the huge domestic market. Even so, some

¹⁹ Richard F. Grimmett, "Conventional Arms Transfers to Developing Nations, 2001–2008," Congressional Research Service, CRS Report, R40795, September 4, 2009, 34, 37, 48, 51.

²⁰ SIPRI, SIPRI Arms Transfers Database, <http://www.sipri.org/databases/armstransfers>.

²¹ Grimmett, "Conventional Arms Transfers," 45, 59–60.

²² Richard A. Bitzinger, "Introduction," in *The Modern Defense Industry: Political, Economic, and Technological Issues*, ed. Richard A. Bitzinger (Santa Barbara: ABC-CLIO, 2009), 5.

weapons systems, such as the F-15 and F-16 fighter jets, are now exclusively produced for foreign markets, and overseas sales are therefore essential to keeping these assembly lines open.

Unsurprisingly, many leading arms-producing nations have come to see the Asia-Pacific arms market—which is both large and increasingly bent on acquiring the most sophisticated weapons systems available—as a particularly lucrative one, and competition to sell to this market has become fierce. Between 2001 and 2008, for example, more than 70% of all Russian arms deliveries, worth approximately \$26.5 billion, went to this region.²³ Whereas in the past the bulk of Russian arms exports to the Asia-Pacific were delivered mainly to China and India, as of late Moscow has been able to expand its customer base within the region, especially within Southeast Asia, by selling fighter jets to Malaysia and Indonesia, submarines to Vietnam, helicopters to Thailand, and tanks to Myanmar, to name but a few recent deals.

The leading Western European arms producers—the UK, France, Germany, and Italy—also depend heavily on the Asia-Pacific market. Together, these four countries exported nearly \$10 billion worth of arms to the Asia-Pacific over the period 2001–08. Although this figure is down significantly from the more than \$19 billion worth of deliveries during the period 1994–2001, the region nevertheless remains an essential market for many European arms manufacturers.²⁴ Nearly 45% of France's arms exports went to Asia during the 2005–08 period; for Germany, 56% of exports were delivered to Asia, and for Italy, 33%. Only the UK had a relatively low level of dependency on arms deliveries to the region (17%), due to a handful of sizable sales to the Middle East (e.g., a 5 billion-pound deal with Saudi Arabia for 72 Eurofighter Typhoon combat aircraft).²⁵

The United States also exports considerable numbers of weapons systems to the Asia-Pacific. Between 2001 and 2008, it delivered \$18.4 billion worth of arms to the region, accounting for approximately one-third of all U.S. arms exports during this period. Only the Middle East, at \$35.6 billion, was a larger arms market for the United States.²⁶

As competition has heated up, supplier restraint has been replaced by a readiness on the part of the major arms producers to sell just about any type of conventional weapon system available. In addition, supplier states are increasingly prepared to offer technology transfers, licensed production,

²³ Grimmett, "Conventional Arms Transfers," 51, 53.

²⁴ Ibid.

²⁵ David Roberson, "BAE Confirms £5bn Eurofighter Sale to Saudi Arabia," *Times* (London), August 19, 2006.

²⁶ Grimmett, "Conventional Arms Transfers," 48, 51.

and other kinds of offsets as inducements to make a sale. Germany, for example, has transferred submarine technology to South Korea, and Russia has licensed the production of Su-27s to China and Su-30s to India.²⁷

The Revolution in Military Affairs

Finally, certain aspects of the current IT-led revolution in military affairs must be factored into modernization activities taking place within Asia-Pacific militaries. The RMA is often described as a process of discontinuous and disruptive change in the nature of warfare. Andrew Krepinevich, for example, argues that an RMA occurs when

the application of new technologies into a significant number of military systems combines with innovative operational concepts and organizational adaptation in a way that fundamentally alters the character and conduct of a conflict. It does so by producing a dramatic increase...in the combat potential and military effectiveness of armed forces.²⁸

History is replete with numerous examples of RMAs, and, in general, these revolutions have entailed the linking of one or more technological breakthroughs (such as gunpowder, the internal combustion engine, radio, or nuclear weapons) with one or more organizational, institutional, or operational concept (for example, the *levée en masse* or *blitzkrieg*). The current IT-led RMA is generally seen as derived from the emerging notions of network-centric warfare made possible by the information revolution. IT advances have facilitated significant innovation and improvement in the fields of sensors, seekers, data management, computing and communications, automation, range, and precision. Network-centric warfare permits the “linking of people, platforms, weapons, sensors, and decision aids into a single network” that “creates a whole that is clearly greater than the sum of its parts,” resulting in “networked forces that operate with increased speed and synchronization and are capable of achieving massed effects.”²⁹ Consequently, network-centric warfare “generates increased combat power by networking sensors, decision makers, and shooters to achieve shared

²⁷ Richard A. Bitzinger, “Arms Exports to Asia-Pacific Region Increase,” RSIS, November 13, 2006, available at <http://www.isn.ethz.ch/isn/Current-Affairs/Security-Watch/Detail/?ots591=0c54e3b3-1e9c-be1e-2c24-a6a8c7060233&lng=en&id=52719>.

²⁸ Andrew Krepinevich, “From Cavalry to Computer: The Pattern of Military Revolutions,” *National Interest* (Fall 1994): 30.

²⁹ “Elements of Defense Transformation,” Office of Force Transformation, U.S. Department of Defense, October 2004, 8.

awareness, increased speed of command, high tempo of operations, greater lethality, increased survivability, and a degree of self-synchronization.”³⁰

To be sure, the RMA as an operational concept has come under a good deal of criticism lately.³¹ Nevertheless, many of the precepts of the current network-centric RMA—particularly the basic idea of more “expeditionary, agile, and lethal forces,” capable of employing “operational maneuver and precision effects,”³² informed by improved and shared situational battlespace awareness, and enabled by sophisticated C4 (command, control, communications, and computers), which is the very essence of network-centric warfare—still have significant appeal to currently modernizing militaries. Mobility, joint operations, power projection, precision-strike capability, and, above all, the potential of information warfare, the digitization of the battlefield, and networked systems to act as powerful force multipliers in combat also all continue to be important to countries in the Asia-Pacific as they grapple with military modernization in the 21st century.

Quantifying Military Modernization in Asia

Over the past decade or so, many countries throughout the Asia-Pacific have initiated ambitious military modernization programs. As a result of both indigenous production and arms imports, these militaries have gained or are currently gaining capabilities that they did not possess earlier, such as new means for power projection, precision strike, long-range attack, lethality and firepower, and, in particular, battlespace intelligence, communications, and command and control. These new capabilities are especially due to recent acquisitions by Asian countries of modern surface combatants, amphibious assault vessels, aircraft carriers, submarines, advanced fighter aircraft armed with long-range air-to-air missiles, missile defenses, and a host of new precision-guided munitions, including antiship and land-attack cruise missiles, stand-off weapons, and smart bombs (see **Table 1**). Additionally, these weapons acquisitions are being complemented by greatly improved C4ISR systems, including unmanned aerial vehicles and drones, airborne early warning aircraft, and state-of-the-art communications networks.

³⁰ “Network-Centric Warfare: Creating a Decisive Warfighting Advantage,” Office of Force Transformation, U.S. Department of Defense, 2003, 2.

³¹ See Richard A. Bitzinger, “Is the RMA Dead?” in *Strategic Currents: Marking the Transition to the S. Rajaratnam School of International Studies*, ed. Yang Razali Kassim (Singapore: RSIS, 2006).

³² “Elements of Defense Transformation,” 8.

TABLE 1 Major Asia-Pacific arms acquisition programs

	Surface combatants	Amphibious ships and aircraft carriers	Submarines	Combat aircraft	Missiles and other systems
Australia	<ul style="list-style-type: none"> Building 3 Hobart-class air warfare destroyers, equipped with Aegis combat system, SM-2 air-defense missile; could be upgraded to MD capability 	<ul style="list-style-type: none"> Building 2 Canberra-class LHDs; could be upgraded to STOVL-type aircraft carrier 	<ul style="list-style-type: none"> 6 Collins-class diesel-electric submarines, acquired in the 1990s and scheduled for upgrading; to be replaced after 2025 	<ul style="list-style-type: none"> Acquiring 24 F/A-18E/F Partner in the Joint Strike Fighter (F-35) program and may acquire up to 100 F-35s 	<ul style="list-style-type: none"> AAM: AMRAAM ASCM: Harpoon AGM: JSOW, Popeye
China	<ul style="list-style-type: none"> 6 Type-051C/-052B/-052C destroyers, acquired in the 2000s 4 Russian-built Sovremenny-class destroyers, acquired in the 1990s–2000s Building 8+ Type-054/-054A frigates 	<ul style="list-style-type: none"> 1 Type-071 LPD, more in this class may be forthcoming May acquire aircraft carriers (ex-<i>Varyag</i> by 2011, plus additional indigenous carriers) May build LHD-class vessel 	<ul style="list-style-type: none"> 20+ Song-/Yuan-class submarines Acquired 12 Russian-built Kilo-class submarines 2+ Shang-class nuclear-powered attack submarines 2+ Type-094 ballistic missile submarines 	<ul style="list-style-type: none"> Approximately 300 Su-27/-30 fighters (some Su-27s locally produced) Building 300+ J-10 fighters 	<ul style="list-style-type: none"> AAM: R-77, PL-12 ASCM: 3M-54E/E1 Sunburn, 3M-80E Moskit, YJ-83 LACM: DH-10 SSM: DF-11/-15
India	<ul style="list-style-type: none"> Building 3 (possibly more) Type-15A Kolkata-class destroyers 	<ul style="list-style-type: none"> Acquiring ex-Russian Kiev-class STOVL aircraft carrier, to be modified to fly MiG-29 fighters Building indigenous aircraft carrier, INS <i>Vikrant</i>, to fly MiG-29 or Tejas fighters 	<ul style="list-style-type: none"> Acquiring 6 to 12 Scorpène-class submarines; later submarines could be AIP Launched first nuclear-powered submarine in 2009 	<ul style="list-style-type: none"> Acquiring 240+ Su-30MKI fighters (some locally produced) Plans to acquire up to 260 locally produced Tejas fighters Plans to acquire 126 foreign-built fighters 	<ul style="list-style-type: none"> AAM: R-77 ASCM: Exocet, Brahmos SSM: Prithvi, Agni

Table 1 continued.

	Surface combatants	Amphibious ships and aircraft carriers	Submarines	Combat aircraft	Missiles and other systems
Indonesia	<ul style="list-style-type: none"> Acquiring 4 Dutch-built Sigma-class corvettes 	<ul style="list-style-type: none"> Acquiring 4 Korean-built LDPs 	<ul style="list-style-type: none"> Requirement for up to 6 submarines but acquisition uncertain 	<ul style="list-style-type: none"> 10+ Su-27/-30 fighters 	<ul style="list-style-type: none"> AAM: R-77 ASCM: YJ-83
Japan	<ul style="list-style-type: none"> Building 4 Hyuga-class helicopter destroyers (DDH); could be upgraded to LHD or STOVL-type aircraft carrier Deploying 6 Kongo- and Atago-class destroyers, equipped with upgraded Aegis combat system and SM-3 missile for MD 	<ul style="list-style-type: none"> 3 Osumi-class LPDs, acquired in the 1990s 	<ul style="list-style-type: none"> Building 9+ Soryu-class AIP-equipped submarines 	<ul style="list-style-type: none"> Approximately 100 F-2 fighters Plans to acquire fifth-generation fighter 	<ul style="list-style-type: none"> AAM: AMRAAM, AAM-5 ASCM: Harpoon AGM: JDAM
Malaysia	<ul style="list-style-type: none"> Acquiring 2 British-built Lekiu-class frigates, but program uncertain 6 German-designed, locally built MEKO A100 OPVs; earlier plans to build 27 OPVs scaled back due to program delays and cost overruns 	N/A	<ul style="list-style-type: none"> Acquiring 2 French-built Scorpène-class submarines 	<ul style="list-style-type: none"> 18 Su-30MKM fighters Plans to acquire 18 additional fighters, type undecided 	<ul style="list-style-type: none"> AAM: R-77 ASCM: Excoet MRL: ASTROS-II

Table 1 continued.

Singapore	<ul style="list-style-type: none"> • 6 French-designed Formidable-class “stealth” frigates, acquired 2000s 	<ul style="list-style-type: none"> • 4 Endurance-class LPDs, acquired in the 1990s 	<ul style="list-style-type: none"> • 4 ex-Swedish A-12 submarines, acquired in the 1990s • Acquiring 2 ex-Swedish A-17 submarines 	<ul style="list-style-type: none"> • 24 F-15S fighters • 74 F-16 Block 52/52+ fighters • Partner in the Joint Strike Fighter (F-35) program 	<ul style="list-style-type: none"> • AAM: AMRAAM, Python IV, AIM-9X • ASCM: Harpoon • AGM: JSOW, JDAM • MRL: HIMARS
South Korea	<ul style="list-style-type: none"> • Building 3 KDX-III destroyers, equipped with Aegis combat system, SM-2 air-defense missile; could be upgraded to MD capability • 3 KDX-I and 6 KDX-II destroyers, acquired in the 1990s–2000s 	<ul style="list-style-type: none"> • Building 2+ Dokdo-class LPDs; could be upgraded to STOVL-type aircraft carrier 	<ul style="list-style-type: none"> • 9 German-designed Type-209 submarines, acquired in the 1990s • Building 3+ German-designed Type-214 AIP-equipped submarines 	<ul style="list-style-type: none"> • 61 F-15K fighters • 160 F-16 fighters • Plans to acquire fifth-generation fighter 	<ul style="list-style-type: none"> • AAM: AMRAAM • ASCM: Harpoon, Haesung • LACM: Hyunmoo-IIIC • AGM: JDAM, JASSM
Thailand	<ul style="list-style-type: none"> • 2 Chinese-built Type-053 frigates, acquired in the 1990s 	<ul style="list-style-type: none"> • 1 Spanish-built STOVL aircraft carrier, equipped with AV-8A STOVL fighters, acquired in the 1990s; most fighters inoperable 	<ul style="list-style-type: none"> • Requirement for 2+ submarines 	<ul style="list-style-type: none"> • 6–12 Swedish-built Gripen fighters 	<ul style="list-style-type: none"> • AAM: AMRAAM
Vietnam	<ul style="list-style-type: none"> • Acquiring 2 Russian-built Gepard-class frigates 	N/A	<ul style="list-style-type: none"> • Acquiring 6 Kilo-class submarines 	<ul style="list-style-type: none"> • 12 Su-27 fighters • Acquiring 12+ Su-30MK2V fighters 	<ul style="list-style-type: none"> • AAM: R-77 • ASCM: Kh-35/SS-N-25 Switchblade

SOURCE: Compiled by the author.

NOTE: AAM = air-to-air missile, AGM = air-to-ground munition, AIP = air-independent propulsion, ASCM = antiship cruise missile, LACM = land-attack cruise missile, LHD = landing helicopter dock, LPD = land platform dock, MD = missile defense, MRL = multiple-rocket launcher, OPV = offshore patrol vessel, SSM = surface-to-surface missile, and STOVL = short takeoff/vertical landing.

Large Surface Combatants

Asia-Pacific navies have expanded considerably over the past ten to fifteen years, both in terms of quantity and in terms of capabilities. Many navies in the region that were once oriented mainly toward coastal defense—the so-called brown waters—are being upgraded to green water or even blue water (open ocean) capacities. Many countries in the region have consequently added larger surface combatants to their fleets, which greatly extends their range of operations as well as their sustainability and firepower.

Between 2000 and 2008, for example, China constructed six destroyers of three different types—including one class (the Type-052C Luyang II) outfitted with an Aegis-type air-defense radar and fire-control system. In addition, China has built twelve new frigates—including one class that features a stealth design—as well as a new-generation catamaran-hull missile fast attack craft (of which several dozens may be built). The People's Liberation Army Navy (PLAN) also acquired four Sovremennyy-class destroyers from Russia in the late 1990s and early 2000s. Chinese-built warships are equipped with indigenous antiship cruise missiles (either the YJ-83 or YJ-62) and Russian or Chinese surface-to-air missiles, housed in vertical launch systems (VLS). The Russian Sovremennyy destroyers are outfitted with the 3M-80E Moskit (also known as SS-N-22 Sunburn) ramjet-powered, supersonic, antiship cruise missile (ASCM), which has a range of 120 kilometers. Newer missiles have a 200-kilometer range.

Australia is planning to acquire and construct three air warfare destroyers (AWD), which will be based on the U.S. Aegis combat system and the SM-2 Standard surface-to-air missile. These AWDs, known as the Hobart-class, are especially important to the ADF's new expeditionary strategy, as they will provide necessary protection to new amphibious, sealift, and support ships from air-breathing attacks (aircraft and antiship cruise missiles).³³

The Republic of Korea Navy (ROKN) has contracted for three 7700-ton KDX-III destroyers (also known as the King Sejong the Great-class) and has optioned for three more. The KDX-III is a vast improvement over other destroyers in the ROKN, being equipped with the U.S.-supplied Aegis air-defense radar and fire-control system as well as the Standard SM-2 Block IIIB air-defense missile. As with the Australian AWD, the KDX-III could be upgraded to the SM-3 missile for antitactical ballistic missile operations, although this is currently not being planned. In addition, the KDX-III is armed with the Hyunmoo-IIIC land-attack cruise missile (LACM) and

³³ Ian Bostock, "Country Briefing: Australia—Reaching Out," *Jane's Defence Weekly*, November 3, 2004.

either the Harpoon or the indigenous Haesung (Sea Star) ASCM. All these missiles are housed in 128 vertical launch cells.

The move from brown water to open-ocean navies has been particularly pronounced in Southeast Asia. The Republic of Singapore Navy (RSN) recently acquired six Formidable-class frigates (based on the French Lafayette-class stealth vessel), armed with Harpoon ASCMs and the French Aster-15 air-defense missile; these frigates are a significant increase in the RSN's power-projection capabilities. Indonesia is currently acquiring four new Sigma-class corvettes from the Netherlands, equipped with Chinese C-802 (YJ-83) ASCMs, while Malaysia is presently building six German-designed MEKO A100 offshore patrol vessels as well as buying two British-built Lekiu-class frigates.

Force Projection, Expeditionary Warfare, and Aircraft Carriers

Many local navies either have expanded or are in the process of expanding their capacities for force projection and expeditionary warfare, in particular via the acquisition of platforms capable of operating rotary-wing and, increasingly, fixed-wing aircraft. China has recently launched the Type-071 LPD (landing platform dock), a 20,000-ton amphibious warfare ship equipped with two helicopters and two air-cushioned landing craft (LCAC) and capable of carrying up to eight hundred troops. The PLAN reportedly could acquire up to eight Type-071s, and these vessels could be complemented by a new larger LHD-type (helicopter-based) amphibious assault ship.³⁴

Meanwhile, rumors continue to circulate that China plans to deploy one or more—and perhaps up to six—full-deck aircraft carriers. There is considerable speculation that the Chinese military is restoring the Russian-built *Varyag*—sold to China in 2001, ostensibly for the purposes of being turned into a casino in Macau—and will turn the carrier into a training carrier, commissioning it by 2011. More importantly, many believe that China will soon start building a fleet of indigenously designed carriers, and outfit these with either a Russian fighter (MiG-29 or Su-33) or Chinese fighter (a naval version of the J-10).

The Japan Maritime Self-Defense Force (MSDF) has also been expanding its capacities for power projection through the acquisition of high-speed sealift ships (for logistics and transport) and three large amphibious Osumi-class ships. Ostensibly designated as an LST (landing

³⁴ Ronald O'Rourke, "PLAN Force Structure: Submarines, Ships, and Aircraft" (paper presented at the conference "The Chinese Navy: Expanding Capabilities, Evolving Roles?" Taipei, November 29–December 1, 2007), 19; and "Type 071 Landing Platform Dock," Sinodefence.com, June 5, 2008, <http://www.sinodefence.com/navy/amphibious/type071.asp>.

ship tank), the Osumi-class vessel is of a size and design more resembling a LPD (including a large open deck for helicopters). The 13,000-ton Osumi can carry 330 troops and up to ten tanks, and is outfitted with four helicopters and two LCAC hovercraft transports. Additionally, the MSDF is currently acquiring four Hyuga-class “helicopter destroyers” (DDH). At 13,500 tons and with a through-deck design and below-deck hangars, the Hyuga DDH more resembles a small aircraft carrier, similar to the Spanish Navy’s *Principe de Asturias* or the British Royal Navy’s Invincible-class carriers. The Hyuga DDH, however, is intended only for use with helicopters for antisubmarine warfare.

Perhaps in order not to be outdone by Japan, South Korea is in the process of accepting into service the Dokdo-class amphibious assault vessel. The Dokdo-class LPX (landing platform experimental) displaces 14,000 tons and is capable of carrying seven hundred troops, ten tanks, fifteen helicopters, and two LCAC.³⁵ The Dokdo is intended to serve as a multifunctional vessel, in particular, serving as a fleet command ship for a “rapid response fleet” that would include one Dokdo-class ship and several destroyers, frigates, and submarines.³⁶ At least two Dokdo-class vessels have been ordered—designed and built by Korean shipyards—and the first was commissioned into the ROKN in 2007; the ROKN may eventually deploy up to four ships in this class.

Australia’s growing requirement for amphibious and expeditionary warfare includes the ability to move and sustain a force of three thousand soldiers. Consequently, the Royal Australian Navy (RAN) plans to acquire two new 28,000-ton Canberra-class amphibious power projection (helicopter-based, LHD-type) ships, each capable of transporting one thousand troops and 150 vehicles (including the Australian Army’s new M1A1 Abrams tanks) and carrying both landing craft and a mix of transport and battlefield support helicopters. These ships, based on a Spanish design, will provide air support, amphibious assault, transport, and command center roles. This program will cost 3 billion Australian dollars, and the first Canberra-class LHD is due to enter service around 2013.³⁷

Though Japan, South Korea, and Australia have no plans at the moment to acquire fixed-wing aircraft carriers, their current classes of open flight-deck helicopter ships—the Hyuga, the Dokdo, and the Canberra—could

³⁵ “LP-X Dokdo (Landing Platform Experimental) Amphibious Ship,” GlobalSecurity.org, <http://www.globalsecurity.org/military/world/rok/lp-x.htm>.

³⁶ Ibid.

³⁷ Brendan Nelson, “\$3 Billion Amphibious Ship Will Strengthen ADF, Boost Australian Industry,” Office of the Minister of Defence, Australian Department of Defence, June 20, 2007, <http://www.minister.defence.gov.au/NelsonMintpl.cfm?CurrentId=6780>.

conceivably be modified (for example, by adding a “ski-jump” deck) to serve as pocket carriers capable of operating short take-off/vertical landing (STOVL) combat jets, such as the F-35B Joint Strike Fighter (JSF). It is worth noting that the Canberra-class LHD retains the ski-lift for fixed-wing aircraft that was part of the original Spanish design.

For its part, India is already putting considerable resources into building a carrier-centered navy and is currently in the process of replacing its two aging British-built carriers. In the first place, the navy is acquiring the Soviet-built *Admiral Gorshkov*, a 45,000-ton Kiev-class carrier, decommissioned by the Russian Navy in 1996. After several years of strenuous negotiations, Moscow and New Delhi agreed to a deal whereby Russia would provide the carrier *gratis*, while India would pay Russia approximately \$1 billion to refit and upgrade the vessel to be capable of flying navy MiG-29 fighters off its deck in a STOBAR (short take-off but assisted recovery) configuration.³⁸ This entailed stripping off the weaponry from the ship’s foredeck and adding a 14.3 degree ski-jump on the bow and three arrestor wires on the angled landing deck. In addition, India will pay another \$700 million toward the aircraft and weapons systems, which include twelve single-seat MiG-29K Fulcrum-D fighter jets, four dual-seat MiG-29KUB trainer aircraft, and six Kamov Ka-27 and Ka-31 helicopters, along with training, simulators, spare parts, and maintenance facilities.³⁹

The carrier, which will be renamed the INS *Vikramaditya*, was supposed to have been delivered to the Indian Navy in mid-2008, but refitting the vessel has turned out to be much more challenging than originally envisioned, resulting in considerable cost overruns—Moscow has asked for an additional \$1.2 billion to finish the upgrade—and delays. Consequently, the *Vikramaditya* is unlikely to enter service until 2013 at the earliest.⁴⁰

The Indian Navy is experiencing similar problems with its indigenous aircraft carrier (IAC), formerly known as the air defense ship (ADS). The IAC, designated the INS *Vikrant*, is a 37,500-ton vessel and will utilize a STOBAR arrangement of ski-jump and arrestor wires and operate either the MiG-29K or India’s indigenous Tejas light combat aircraft (LCA), currently in development. Construction began in 2005 at the Cochin shipyards, but production problems have delayed the IAC’s in-service date by at least three

³⁸ Bedi, “Getting in Step.”

³⁹ “The Vikramaditya [ex-Gorshkov] Aircraft Carrier,” GlobalSecurity.org, <http://www.globalsecurity.org/military/world/india/r-vikramaditya.htm>.

⁴⁰ Edward Hooten, “Modernizing Asia’s Navies,” *Asian Military Review* 18, no. 1 (January 2008): 18; and Bedi, “Getting in Step.”

years, or until 2015 at the earliest.⁴¹ Consequently, the Indian Navy will have to keep its 50-year-old INS *Viraat* (formerly the HMS *Hermes*, operating the Harrier) in service for at least another four or five years. Ultimately, however, the navy wants to operate a two-carrier battle group force—one on each coast—with the *Viraat* in reserve.⁴²

Several Southeast Asian nations have also been acquiring ships for expeditionary, amphibious warfare. The Republic of Singapore Navy, for example, operates two indigenously designed and constructed Endurance-class landing ships, each capable of carrying 350 troops, eighteen tanks, four helicopters, and four landing craft. Meanwhile, both Indonesia and Malaysia are acquiring or considering buying foreign-built LPDs. Finally, it is worth noting that the Royal Thai Navy is the only other navy in Asia besides India to operate a fixed-wing aircraft carrier, the 10,000-ton, Spanish-built *Chakri Nareubet*. This vessel is outfitted with nine used AV-8A Harrier STOVL jets and six S-70B Seahawk helicopters. The *Chakri Nareubet* is rarely put to sea, however, due to its high operating costs, and the operational ability of the ship's Harriers is highly questionable.⁴³

Submarines

The procurement of submarines is another area where Asia-Pacific nations have invested considerable time and effort. In some cases, nations that never before had submarines forces are now acquiring their first boats. China has acquired 12 Kilo-class submarines from Russia since the late 1990s; during the same period it has also constructed sixteen Song-class and four Yuan-class diesel-electric submarines, and at least two Type-093 Shang-class nuclear-powered attack submarines. In addition, China is building a new class of nuclear-powered ballistic missile submarines (SSBN), the Type-094 Jin-class SSBN, of which two so far have been delivered to the PLAN.⁴⁴

Japan is currently building a new class of diesel-electric submarines (the Soryu) equipped with the Stirling engine for air-independent propulsion (AIP). At least four boats in this class are under construction and five more are planned, to be built at a rate of approximately one submarine a year.

⁴¹ Hooten, "Modernizing Asia's Navies," 8; and "The Vikrant-class Air Defense Ship," GlobalSecurity.org, <http://www.globalsecurity.org/military/world/india/ads.htm>.

⁴² Bedi, "Getting in Step."

⁴³ Richard A. Bitzinger, "A New Arms Race? Explaining Recent Southeast Asian Military Acquisitions," *Contemporary Southeast Asia* 32, no. 1 (April 2010): 50–69.

⁴⁴ O'Rourke, "PLAN Force Structure," 4–9, 13–18.

Australia took delivery of six Collins-class submarines between 1990 and 2003. In its 2009 defense white paper, Canberra announced that it would eventually replace the Collins-class with a fleet of twelve new boats by 2030.

South Korea is also increasing its submarine fleet. During the 1990s, the ROKN acquired nine German-designed Type-209 diesel-electric submarines, designated the KSS-I Changbogo-class, which were subsequently built in South Korea under license. These are now being replaced by the German Type-214 Chungji-class (KSS-II). The Type-214 is notable for being outfitted with fuel-cells for air-independent propulsion, permitting the boat to remain submerged much longer (up to three weeks) than conventional diesel-electric submarines. South Korea is building three Type-214 submarines under license—the first of which was commissioned by the ROKN in 2008—and holds options on six more.⁴⁵ However, South Korea may instead attempt to design and build its own class of submarine, the KSS-III (perhaps up to nine boats).⁴⁶ Depending on how many KSS-IIs and KSS-IIIs are ordered, the ROKN could be operating a fleet of up to eighteen submarines by 2020–25.

After protracted negotiations, India has finally signed an agreement to acquire six Franco-Spanish Scorpène-class submarines, which will be constructed under license at India's Mazagon Docks shipyard; six additional submarines may subsequently be ordered, which could be outfitted with the French MESMA (*module d'énergie sous-marine autonome*) system for air-independent propulsion.⁴⁷ In addition, the country is keen to develop a nuclear submarine fleet, and it is currently leasing two Akula-class submarines from Russia. India also wants to build its own nuclear-powered submarines—both hunter-attack (SSN) and ballistic missile-carrying (SSBN)—and has consequently been working on its Advanced Technology Vessel (ATV) program for over 35 years. The Indian Navy launched its first ATV in 2009 and ultimately by 2015 would like to deploy a fleet of three SSBNs that are armed with the indigenously developed Sagarika submarine-launched ballistic missile (SLBM).⁴⁸

Turning to Southeast Asia, Singapore possessed no submarine fleet at all until the late 1990s, when it acquired four used 1960s-era submarines from Sweden. In 2009, Singapore took delivery of two more former Swedish Navy submarines; significantly, these boats, renamed the Archer-class, have been

⁴⁵ Tim Fish, "Seoul Commissions Type 214 Sub," *Jane's Defence Weekly*, January 23, 2008.

⁴⁶ Robert Karnoil, "Team Prepares for 2007 Start on KSS-III Design," *Jane's Defence Weekly*, December 20, 2006.

⁴⁷ Rajat Pandit, "India Plans to Buy 6 New Subs, Says Navy Chief," *Times of India*, December 2, 2007.

⁴⁸ Sandeep Unnithan, "The Secret Undersea Weapon," *India Today*, January 17, 2008.

retrofitted with the Stirling AIP engine.⁴⁹ For its part, Kuala Lumpur has recently taken delivery of two Franco-Spanish Scorpene-class submarines for the Royal Malaysian Navy (RMN), both of which were commissioned in 2009, while the Vietnamese navy recently announced its intention to buy six Kilo-class diesel-electric submarines from Russia at a cost of \$2 billion.⁵⁰ In the mid-2000s, rumors were floating around that Indonesia would acquire four Kilo-class and two Lada-class submarines from Russia to replace the navy's two aging German-built Type-209 boats. This deal apparently fell through, however, after Moscow refused to allow Jakarta to use Russian credits to construct a submarine base. Nevertheless, Jakarta still has an outstanding requirement for up to six submarines that will likely be bought from Germany, France, or Russia, or acquired used from South Korea.⁵¹ Thailand also has a requirement for two or more submarines.

Advanced Combat Aircraft

Nearly every Asia-Pacific country currently possesses or is in the process of acquiring at least some fourth-generation or "fourth-generation-plus" fighter aircraft, capable of firing stand-off active radar-guided medium-range air-to-air missiles or delivering precision-guided air-to-surface munitions. China, for instance, has acquired approximately 300 Su-27 and Su-30 combat aircraft, including licensed production of the Su-27 at the Shenyang Aircraft Company in Manchuria. Moreover, the military is supplementing these purchases with the manufacture of its first indigenous fourth-generation-plus fighter, the J-10. The J-10 is an agile fighter jet in roughly the same class as the F-16C and features fly-by-wire flight controls and a glass cockpit.

Japan has completed acquisition of approximately 100 indigenous F-2 fighters (a heavily modified version of the F-16), to complement its force of over 200 F-15s. Tokyo intends to acquire, either through import or indigenous development, a fifth-generation fighter (F-22 or F-35 type) sometime over the next two decades. In South Korea, the ROK Air Force (ROKAF) is acquiring 61 F-15Ks, and plans to acquire up to 60 fifth-generation fighters. The Royal Australian Air Force (RAAF) is in the process of replacing its aging F-111 and F/A-18A/B fighters with the F-35

⁴⁹ Tim Fish and Richard Scott, "Archer Launch Marks Next Step for Singapore's Submarine Force," *Jane's Defence Weekly*, June 18, 2009.

⁵⁰ Nga Pham, "Vietnam to Buy Russian Submarines," *BBC News*, December 16, 2009.

⁵¹ "Russia, Korea to Fight for RI Submarine Contract," *Jakarta Post*, August 11, 2009; and "Defense Ministry Postpones Purchase of Submarines," *Antara News Agency*, July 29, 2009.

Joint Strike Fighter (JSF). In the meantime, the RAAF has acquired 24 F/A-18F fighters to fill the gap.

India has obtained, either through import or licensed production, 240 Su-30MKI fighter jets, and could buy up to 50 more eventually.⁵² India also plans to acquire up to 220 indigenous Tejas LCAs, although it should be noted that this program is heavily delayed. In the meantime, the Indian Air Force has opened a competition to buy 126 fighters from a foreign supplier; candidates include the F-16, the Swedish Gripen, and the MiG-29.

The Republic of Singapore Air Force (RSAF) is the most advanced of all Southeast Asian air forces. The RSAF, for example, possesses 74 F-16s of the latest Block 52/52+ type. In addition, in 2005 the RSAF placed its first order of F-15SG fighters for a total of 24 aircraft, the first 12 of which have been delivered and are stationed in the United States for RSAF training. Singapore, incidentally, is a partner in the international JSF program and could buy upwards of 100 F-35 fighters.⁵³ Other recent Southeast Asian fighter jet purchases include 18 Su-30MKM Flankers by Malaysia, with plans to buy another 18 fighter aircraft (either the Swedish Gripen or additional Su-30s); 6 to 12 Gripens by Thailand; and 10 Sukhoi (two Su-27s and eight Su-30s) by Indonesia, with hopes to eventually purchase up to 40 Su-27/-30 aircraft.⁵⁴

Missile Defenses

Japan, Australia, China, India, and Taiwan are all in the midst of acquiring missile defenses. Japan, for example, has recently completed upgrading its fleet of six Aegis-class destroyers to the U.S. Navy's Sea-based Midcourse Defense (SMD) missile defense mode. The SMD upgrade entails improvements to the current SPY-1 multifunction phased-array radar and fire-control system that increase the range and altitude of its search, detection, track, engagement, and control functions in order to handle exo-atmospheric anti-missile engagements. This program also entails the deployment of a new interceptor missile, the Standard SM-3 Block IA missile, which includes a third-stage for extended range and a Lightweight Exo-Atmospheric Projectile (LEAP) kinetic warhead for terminal homing and intercept. Japan's SMD system should be fully deployed by 2011. SMD is

⁵² Rajat Pandit, "IAF Wants 50 More Sukhoi to Counter China, Pakistan," *Times of India*, October 2, 2009.

⁵³ Jermyn Chow, "F-15 Training Cements Ties with US," *Straits Times*, November 21, 2009.

⁵⁴ Trefor Moss, "Painful Progress: Indonesia Country Briefing," *Jane's Defence Weekly*, October 16, 2009; and Tan, "Force Modernization Trends in Southeast Asia," 17.

complemented by the land-based Patriot PAC-3 system that provides endo-atmospheric protection against missile threats to the Japanese homeland.

Other Asia-Pacific nations are following suit with missile defense plans. India has purchased the Israeli Green Pine ballistic missile early-warning radar, and New Delhi is currently working to create a national missile defense system that uses both the Russian S-300 surface-to-air missile and a variety of indigenously developed exo-atmospheric and point-defense missile systems. China conducted a missile defense test in early 2010, and Taiwan is attempting to modify its indigenous Tien Kung II SAM into a working missile interceptor.⁵⁵

Australia's and South Korea's planned acquisition of several Aegis-equipped warships could conceivably provide the basis for their national missile defenses, based on the SMD concept. In particular, Australia is attempting to integrate the indigenously developed Jindalee Over-the-Horizon Radar Network (JORN) into the U.S. missile defense configuration, thereby upgrading the JORN system—currently used to detect aircraft at long range—to give it the capability to detect incoming missiles during their early boost phase.⁵⁶ South Korea recently announced plans to inaugurate an indigenous missile defense system by 2012 in order to defend against North Korean ballistic missile threats. This program will likely include both land- and sea-based interceptors and will cost at least 300 billion won (\$214 million).⁵⁷

Long-range, Precision-strike Weapons

At least as important as the acquisition of modern military platforms throughout the Asia-Pacific is the steady proliferation of precision-guided weapons for stand-off strike. As mentioned already, many new surface combatants and submarines being deployed in the region are equipped with advanced antiship cruise missiles, such as the Harpoon on Australia's Hobart-class destroyer, Singapore's Formidable-class frigate, and Japan's Soryu-class submarine; the Exocet on Malaysian and Indian Scorpene-class submarines; and the Russian 3M-80E Moskit on Chinese Sovremennyy-class destroyers. India has developed the Brahmos supersonic antiship cruise missile in cooperation with Russia, which will be deployed in a variety of

⁵⁵ "China: Missile Defense System Test Successful," *USA Today*, January 11, 2010; and "Taiwan to Upgrade to Tien Kung-2 SAM," *Missilethreat.com*, July 31, 2006, <http://www.missilethreat.com/archives/id.419/detail.asp>.

⁵⁶ Richard A. Bitzinger, "Asia-Pacific Missile Defense Cooperation and the United States 2004–2005: A Mixed Bag," Asia-Pacific Center for Security Studies, Special Assessment, February 2005, 4, <http://www.apcss.org/Publications/SAS/APandtheUS/BitzingerMissile1.pdf>.

⁵⁷ "South Korea to Complete Missile Defense by 2012," *Defense News*, February 15, 2010.

sea-, land-, and air-based modes, and Taiwan is currently developing the Hsiung Feng III (HF-3) supersonic ASCM.

Additionally, many countries are acquiring active radar-guided, medium-range air-to-air missiles for their fighter aircraft. These include the U.S. AMRAAM (advanced medium-range air-to-air missile) by Australia, Japan, South Korea, Singapore, and Thailand; the Russian R-77/AA-12 by China, Indonesia, and Malaysia; and the PL-12 by China. In the case of AMRAAM, this missile was embargoed for sale to many states in the region until recently.

At the same time, Asian-Pacific militaries are being increasingly equipped with stand-off land-attack munitions. Japan, South Korea, and Singapore are buying the GPS-guided Joint Direct Attack Munition (JDAM), while Australia and Singapore are also acquiring the Joint Stand-Off Weapon (JSOW), a precision-guided glide bomb with a range of up to 130 kilometers. More importantly, perhaps, several countries in the region have developed their own land-attack cruise missiles (LACM), many of them adapted from existing ASCMs. Taiwan, for example, is deploying the Hsiung Feng IIE (HF-2E) LACM, based on its HF-2 antiship missile, China has developed the Dong-Hai 10 (DH-10) LACM, and South Korea, the Hyunmoo-IIIC LACM.

Finally, it is important to not discount the strike value of ballistic missiles armed with non-nuclear warheads. China, of course, has deployed a large number of conventionally armed surface-to-surface missiles, including the 300 kilometer-range DF-11 (CSS-7) and the 600 kilometer-range DF-15 (CSS-6) short-range missiles. This is in addition to China's growing arsenal of sophisticated long-range nuclear-tipped ballistic missiles, including the DF-31 (CSS-9) road-mobile, solid-fuel intercontinental ballistic missile (ICBM), with a range of 8,000 kilometers, and the submarine-launched JL-2 (CSS-N-4) missile. India, meanwhile, has developed the short-range Prithvi and medium-range Agni missiles as nuclear delivery vehicles, and it is currently field-testing an SLBM. North Korea, of course, has deployed its notorious Nodong-1 medium-range ballistic missile, and the intermediate-range (6,000 kilometer) Taepodong-2 is under development. Other tactical missile systems in use in the region include the MGM-140 Army Tactical Missile System (ATACMS), in service with the South Korean army, the U.S.-built HIMARS multiple rocket launcher system in Singapore, and the Brazilian ASTROS-II artillery rocket in Malaysia.

Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)

Finally, many Asia-Pacific militaries are engaged in greatly expanding and upgrading their capabilities for C4ISR.⁵⁸ For example, China, Japan, Singapore, and Taiwan all currently possess airborne early-warning and command (AEW+C) aircraft, while Australia, India, South Korea, and Thailand intend to acquire AEW+C aircraft in the near future. Both Japan and South Korea have the Aegis naval sensor and combat system deployed on their largest surface combatants, and Taiwan is buying long-range early-warning radar for ballistic missile detection and tracking.

In addition, nearly every major military in the region is acquiring unmanned aerial vehicles (UAV), while China, India, Japan, South Korea, and Taiwan have all launched satellites for surveillance, communications, or navigation/target acquisition. Moreover, these countries and others in the region are also able to exploit imagery provided by a host of commercial earth-observation satellite operators, such as IKONOS, EROS, and QuickBird.

Several countries in the region—namely, Australia, China, Japan, Singapore, South Korea, and Taiwan—have also made or are presently making considerable investments in new types of information processing, command and control, and communications and datalinks. Australia, for example, is currently engaged in its “Hardened and Networked Army” effort, which seeks enhanced firepower and survivability, improved jointness and interoperability (particularly with U.S. forces), and superior network-enabled capabilities.⁵⁹ The South Korean military, for its part, is developing an integrated tactical communications system, while Taiwan is spending billions of dollars on a new military-wide C4ISR network that will link sensors, computers, and communications across the services.⁶⁰ The Singapore Armed Forces already possesses a secure C4I network, utilizing microwave and fiber-optic channels and linked to air and maritime surveillance systems. In addition, as part of its new “Integrated Knowledge-based Command and Control” (IKC2) concept, Singapore is putting considerable focus on expanding its capabilities for network-centric warfare.⁶¹

⁵⁸ Jason Sherman, “Digital Drive: Focus, Funding Shifts to C4ISR, Precision Weaponry,” *Defense News*, February 16, 2004, 23–24.

⁵⁹ “The Hardened and Networked Army.”

⁶⁰ Sherman, “Digital Drive”; and Jason Sherman, “Taiwan To Build Military-Wide C4ISR Network,” *Defense News*, October 7, 2003.

⁶¹ Bernard Fook Weng Loo, “Transforming the Singapore Armed Forces: Problems and Prospects” (paper presented at the conference “Defense Transformation in the Asia-Pacific: Meeting the Challenge,” Honolulu, March 30–April 1, 2004), 5; and Tim Huxley, “Singapore and Military Transformation” (paper presented at conference “The RMA for Small States: Theory and Application,” Singapore, February 25–26, 2004), 2.

China, in particular, has put considerable emphasis on upgrading C4ISR assets, according to its concepts of “informationalized” warfare. Consequently, the PLA is expanding the use of satellites for communication, surveillance, and navigation, exploiting its manned space program for military purposes, and reportedly experimenting with digitizing its ground forces (similar to the U.S. Army’s “Land Warrior” program). Moreover, the PLA has invested considerable resources in creating a separate military communications network that uses fiber-optic cable, satellites, microwave relays, and long-range high-frequency radio. The PLA has also focused on developing its capacities for “integrated network electronic warfare,” such as electronic defenses and countermeasures, computer network attacks (that is, disrupting the enemy’s computer networks), and physical attacks on the enemy’s C4ISR network, such as with antisatellite (ASAT) weapons.⁶²

Assessing the Impact of Modernization on Military Capabilities

The arms build-up in the Asia-Pacific over the past ten to fifteen years is undeniably significant. In the first place, recent acquisitions by regional militaries constitute something more than mere modernization; rather, the new types of armaments being procured and deployed promise to significantly affect regional warfighting capabilities. Local militaries are acquiring greater lethality and accuracy at longer ranges. Stand-off precision-guided weapons—such as land-attack cruise missiles, tactical ballistic missiles, and a variety of smart munitions, some carried by fourth-generation-plus fighter aircraft—have greatly increased these militaries’ firepower and effectiveness, making them capable of longer distance and yet more precise attack. Additionally, militaries in the Asia-Pacific are acquiring new or increased capabilities for force projection, operational maneuver, and speed. Modern submarines and surface combatants, amphibious assault ships, aircraft carriers, air-to-air refueling abilities, and transport aircraft have all extended these militaries’ theoretical range of action. Regional militaries are also more survivable, due to the increased use of stealth and active defenses, particularly missile defense. Finally, these

⁶² U.S. Department of Defense, *Annual Report on the Military Power of the People’s Republic of China 2009* (Washington, D.C., 2009), 25–28; You Ji, “China’s Emerging National Defense Strategy,” Association for Asian Research, January 12, 2005; Wendell Minnick, “China Shifts Spending Focus to Info War,” *Defense News*, September 11, 2006; Bill Gertz, “Inside the Ring: China Info Warfare,” *Washington Times*, June 2, 2010; and Richard Bitzinger, “China’s RMA: Good Enough?” International Relations and Security Network, August 29, 2007, <http://www.isn.ethz.ch/isn/Current-Affairs/Security-Watch/Detail/?ots591=0C54E3B3-1E9C-BE1E-2C24-A6A8C7060233&lng=en&id=53705>.

forces are improving their capabilities for battlefield knowledge, situational awareness, and command and control. New platforms for reconnaissance and surveillance, especially in the air and in space, have considerably expanded these militaries' capacities to look out over the horizon and across all five areas of the future battlespace: ground, sea, air, space, and the electromagnetic spectrum.

More importantly, many Asia-Pacific militaries—notably Australia, China, and Singapore—are acquiring the types of military equipment that could fundamentally transform their forces along the lines of the IT-led RMA. This embrace of network-enabled warfare—known in Australia as the “Hardened and Networked Army,” in China as “wars under conditions of informationization,” and in Singapore as the “Integrated Knowledge-based Command and Control” concept—is a potentially historic shift. Regional militaries could be on the cusp of bundling together sensors, computers, communications, command and control systems, munitions, and platforms that would greatly improve the synergy of their fighting effectiveness. Such emerging capabilities, particularly on the part of China, could in turn greatly affect strategy and operations in future military endeavors in the Asia-Pacific.

On the other hand, most discussions of military modernization tend to revolve around absolute gains in capabilities. Certainly most Asia-Pacific militaries in 2010 are a vast improvement over their predecessors of 1990 or even 1995, given the addition of fourth-generation-plus combat aircraft, new classes of warships and submarines, precision-strike weapons, and so on. In China, for example, the J-10 and Su-30 fighters have replaced MiG-19s and MiG-21s. Likewise, F-15s are replacing F-4s in the ROKAF and A-4s in the RSAF, and India is supplementing vintage Jaguars, MiG-27s, and Mirage-2000s with Su-30s and the Tejas LCA. Additionally, beyond-visual-range, active radar-guided air-to-air missiles (AAM), such as the AMRAAM and AA-12, are replacing or supplementing older generation AAMS, such as the short-range AIM-9 Sidewinder or the semi-active AIM-7 Sparrow. Moreover, Australia and Singapore are likely to acquire the F-35 fifth-generation fighter, which is perhaps the most capable fighter available on the global arms market. South Korea and Japan are also potential customers for the JSF. In terms of surface combatants, countries such as China, Japan, South Korea, and Australia are acquiring advanced destroyers with sophisticated radars, surface-to-air missiles, and combat systems that provide their militaries with long-range air defense at sea—and even missile defense—capabilities that they did not earlier possess. In the past fifteen years, countries such as South Korea, Malaysia, Singapore, and Vietnam that never possessed much in the way of submarine forces, or, indeed, any

submarines at all, are being equipped with modern boats. In the case of Japan, India, the ROK, and Singapore, these submarines are outfitted with air-independent propulsion that permits them to remain submerged for much longer periods of time. China and India, for their part, have highly ambitious nuclear-powered submarine (both SSN and SSBN) programs. Finally, many Asia-Pacific militaries are being equipped for the first time with a variety of stand-off precision-strike weapons, including JDAMs (Japan, South Korea, and Singapore), JSOW (Australia and Singapore), and the AGM-142 air-to-surface missile (Australia and South Korea). Just as importantly, South Korea and Taiwan have developed their own land-attack cruise missiles, while China and India have gained new capabilities for using ballistic missiles as battlefield strike weapons.

At the same time, these forces are certainly better equipped than in the past with systems for communications, command and control, intelligence, and surveillance. For example, Australia, China, India, Japan, and Singapore (and soon South Korea) have all acquired airborne early-warning and command aircraft, while UAVs have proliferated throughout the region.

Absolute gains in capabilities do not tell the whole story, however. Military power is much more about relative gains—that is, how forces stack up against each other and where their respective comparative advantages and disadvantages lie. Most regional militaries, even China's, pale in comparison with U.S. military forces—which possess sophisticated weapons platforms such as the Nimitz-class nuclear-powered aircraft carrier, Virginia-class nuclear-powered attack submarines, the fifth-generation F-22 fighter jet, and perhaps the most advanced C4ISR infrastructure in the world. Just one Nimitz-class nuclear-powered aircraft carrier, for example, can project airpower equal to the size of many Asia-Pacific countries' entire air forces. As a result, although China may be gaining an edge over militaries in the Asia-Pacific, particularly Taiwan and perhaps even Japan,⁶³ the PLA remains vastly inferior to U.S. forces. Systems such as the J-10 fighter jet, the Song-class submarine, and the Luyang II-class destroyer, though advanced for the PLA, are basically 1980s-era weapons systems. The J-10, for instance, is equivalent to the F-16C fighter, which entered service in the mid-1980s. Even equipment that China has acquired from Russia—such as Su-30MKI fighters, Sovremennyy-class destroyers, and Kilo-class submarines—are hardly cutting-edge, transformational systems. Finally, PLA expeditionary capabilities are still extremely limited due to a shortage of rapid mobility assets, such as amphibious assault vessels, transport aircraft, and utility helicopters. Overall, barely 20% of the PLA's air force, 25% of its surface

⁶³ China now outspends Japan on defense by a factor of nearly two to one, and the PLAN has more destroyers, frigates, and attack submarines than the MSDF.

combatants, and 50% of its submarine fleet are deemed by the U.S. Defense Department to be “modern.”⁶⁴

At the same time, the U.S. military is adding to its Pacific forces. The military build-up on Guam, for example, is a significant development, as is the deployment of a sixth aircraft carrier to the region and the basing of a nuclear-powered carrier at Yokosuka, Japan, for the first time. Additionally, the U.S. military is increasingly engaged with the Japanese MSDF in the area of cooperative missile defense, with Australia in the area of signals intelligence, and with Singapore in establishing the island as a forward-operating site for the U.S. Navy, including the maintenance of the COMLOG WESTPAC (Commander, Logistics Group Western Pacific) facility at Sembawang and the expansion of the Changi Naval Base for use by U.S. aircraft carriers.⁶⁵ Consequently, U.S. forces in the region are likely to retain their qualitative edge for some time to come.

In addition, qualitative improvements may mean little if the quantities procured remain small. This point is particularly apropos in the case of Southeast Asia: though Indonesia, Malaysia, Thailand, and Vietnam are acquiring some relatively modern pieces of equipment, such as fourth-generation-plus fighter jets, surface combatants, and submarines, the numbers are so small as to have little impact on these countries’ warfighting capacities. For example, Thailand is buying just twelve Gripens; Malaysia, only eighteen Su-30MKMs; and Indonesia, just two Su-27s and eight Su-30s.

It has also been argued that any increase in Australia’s expeditionary capabilities might still be too small to make any real difference to U.S. forces in contingency operations. Even after acquiring new Canberra-class LHDs, the ADF will still only be capable of lifting one armored battalion, even though its new doctrine calls for moving a 3,000-man brigade. In addition, the RAAF has no capacity for providing air cover to any expeditionary forces beyond a few hundred kilometers from Australia. All in all, the ADF could end up spending a lot of money without contributing much to coalition operations.⁶⁶ The same questions can also be raised regarding the expeditionary warfighting capacities of South Korea and Japan, both of which still possess only a relative handful of amphibious assault ships. Likewise, whether Japan possesses a sufficient number of Aegis-class destroyers to provide an adequate missile defense shield for

⁶⁴ U.S. Department of Defense, *Annual Report on the Military Power of the People’s Republic of China 2009*, 36.

⁶⁵ The author is grateful to an anonymous reviewer for pointing out the significance of these developments.

⁶⁶ Ian Bostock, “Country Briefing: Australia—Offshore Interests,” *Jane’s Defence Weekly*, January 25, 2006.

the country is questionable, as is whether India's "two-carrier navy" will be operationally effective.

Finally, hardware gains can also mean very little if they are not matched by accompanying developments in the software areas of military modernization, such as doctrine, tactics, training, and systems integration. The evidence, though admittedly thin, suggests that most Asian-Pacific militaries have not embraced this side of force modernization as enthusiastically as the hardware element, thereby undermining the very effectiveness of hardware acquisitions. In particular, there is little to suggest that concepts such as inter-service jointness have really taken hold operationally in many Asia-Pacific militaries. In India, South Korea, and Taiwan, for instance, ground forces still tend to dictate military thinking and decisionmaking, which in turn often limits integrated joint operations. The Indian military, in particular, remains an army-heavy force largely oriented toward a ground war with Pakistan; consequently, the Indian air and naval forces have traditionally had less influence on military operational thinking (although this may now be changing).⁶⁷ Japan's land, air, and naval command districts have no commonality, complicating intra-SDF joint operations.⁶⁸ Consequently, with a few exceptions (such as Singapore, which has established an integrated command structure and also combined its inter-service special operations forces) very little is being done so far to promote jointness as an operational concept in terms of training or doctrine. Most Asia-Pacific militaries are nowhere near as far along in this regard as U.S. forces.

Particularly with respect to embracing network-centric warfare, few militaries in the region (excepting perhaps Australia and Singapore) have moved beyond the theoretical or speculative phase, and fewer still are experimenting with new unit structures (such as the U.S. Army's brigade units of action) or operational strategies. Even then, no country in the region has yet revised its doctrine or fielded reorganized force structures in line with transformational concepts of an RMA based on network-centric warfare.⁶⁹ In some countries—particularly India, Japan, and South Korea—even the debate has been rather thin, and any tangible movement toward true force transformation would appear to be far on the horizon. For instance, after a flurry of research activity in the late

⁶⁷ Bedi, "Getting in Step."

⁶⁸ In fact, it is often said that the MSDF does a better job cooperating with the U.S. Navy than it does with the Ground or Air SDF.

⁶⁹ Thomas G. Mahnken, "Conclusion: The Diffusion of the Emerging Revolution in Military Affairs in Asia: A Preliminary Assessment," in Goldman and Mahnken, *The Information Revolution in Military Affairs in Asia*, 213.

1990s and early 2000s, Japan's Ministry of Defense quietly rolled up its RMA office around 2002.

Even the PLA, which is arguably the furthest along among the larger Asia-Pacific militaries in introducing concepts of jointness and integrated operations, overwhelmingly remains a ground-based army—one that is made up largely of infantry troops and, despite the lip-service paid to informationization, still heavily oriented toward a linear, attrition-based “people's war.”⁷⁰ According to an article in *Jane's Defence Weekly*, the PLA “has yet to promulgate a definitive military doctrine to guide the development of capabilities and operations” according to the principles of “Limited Local Wars under Conditions of ‘Informatization.’”⁷¹ The PLA's hierarchical and top-down command structure and interservice compartmentalization do not seem to have changed significantly, and even the Pentagon acknowledges the PLA's deficiencies in concepts such as jointness.⁷² This sentiment is echoed by China analyst David Finkelstein. Even while asserting that China is pursuing a “revolution in doctrinal affairs,” Finkelstein nevertheless admits that there is still very little substance when it comes to operational guidance and that China's overall national military strategy has not changed much beyond a greater stress on as-yet undefined “integrated joint operations.”⁷³ Overall, he states that “it is uncertain at this point how much the theoretical informs the actual application of the operational art.”⁷⁴

Conclusions

That the Asia-Pacific nations have added considerably to their military arsenals over the past fifteen years or so is not in doubt. Nor does the process of military modernization—propelled by regional geopolitical forces, enabled by robust defense spending and a buyer's market in the international arms market, and stirred by the transformative promise of network-centric warfare—seem to show any signs of abating. Moreover, countries in the region are acquiring hardware that, on the surface at least, imbues their militaries with new capacities for warfighting when it comes

⁷⁰ Dennis J. Blasko, *The Chinese Army Today: Tradition and Transformation for the 21st Century* (New York: Routledge, 2006), 95, 101.

⁷¹ Timothy Hu, “China—Marching Forward,” *Jane's Defence Weekly*, April 25, 2007.

⁷² U.S. Department of Defense, *Annual Report on the Military Power of the People's Republic of China 2009*, viii, 15.

⁷³ David M. Finkelstein, “Thinking about the PLA's ‘Revolution in Doctrinal Affairs,’” in *China's Revolution in Doctrinal Affairs*, ed. James Mulvenon and David Finkelstein (Washington, D.C.: Center for Naval Analyses, 2005), 14–18.

⁷⁴ *Ibid.*, 19.

to mobility, speed, precision strike, firepower, battlespace intelligence, communications, and command and control.

Yet hardware alone does not automatically translate into military capability. Certainly most Asia-Pacific militaries are better equipped now than they were ten or fifteen years ago, and certainly they possess new weapons systems—modern combat aircraft, beyond-visual range air-to-air missiles, stand-off precision-guided munitions, amphibious assault ships, large multirole warships, quieter submarines capable of longer submerged operations, AEW aircraft, UAVs, and so forth—that provide their forces with options to engage in roles and missions that they previously lacked. Nevertheless, these potential capabilities are at the very least tempered by possible deficiencies in numbers, training, doctrine, and other software factors. Bean-counting only goes so far, and the true value of new weapons systems will be undermined if not accompanied by skilled personnel and sufficient numbers of associated systems (e.g., air-launched weapons to work with a new combat aircraft), or if militaries fail to take advantage of the full potential of these systems by also engaging in organizational or doctrinal changes.

There are both positives and negatives in such circumstances. On the one hand, the military power of certain states in the region, such as China, to challenge the United States and the regional security calculus could be much less than it appears, subsequently making these states much less potentially threatening or destabilizing to the regional status quo. On the other hand, these circumstances could also mean that U.S. allies and friendly nations are limited in their ability to contribute to U.S.-led contingency and stabilization operations or to play a significant role in regional security-building.

Of course, the question of capacity and capability is ultimately unanswerable because it is, in the end, subjective. Each country must decide for itself what is an affordable and effective military force, and it may be that “perfection is the enemy of ‘good enough.’” Certainly the hardware acquisitions of the past fifteen years have increased the capabilities of several Asia-Pacific militaries, and will continue to do so. As a result, some countries have gained relative military power over their regional rivals. Notwithstanding a full-scale force transformation, many local militaries have derived benefits from their modernization efforts. While the end result may be only a partial one—and certainly not revolutionary in scope or structure—it could be more than adequate in terms of generating new capabilities and comparative advantages. In other words, military modernization in Asia could still be sufficient, in certain cases, to get the job done.